

Curriculum Vitae: Dr. Anton Meinhart



Personal data:

Date and place of birth: 04/28/1974, Wels (Austria)
Nationality: Austrian

Positions and Education

2006 - Research group leader at the Department of Biomolecular Mechanisms, Max Planck Institute for Medical Research, Heidelberg.
2006 International evaluation for a research group leader position at the associate level / principal investigator.
2004 - 2006 Group leader at the Department of Biomolecular Mechanisms, Max Planck Institute for Medical Research, Heidelberg.
2002 - 2004 Postdoc with Prof. Dr. Patrick Cramer at the Gene Center, Ludwig-Maximilians University, Munich.
2001 - 2002 Postdoc with Prof. Dr. Wolfram Saenger at the Institute for Chemistry and Biochemistry, Free University Berlin.
2001 Graduated “*summa cum laude*” in Biochemistry (Dr. rer. nat.), Free University Berlin.
1999 - 2001 Ph.D. thesis: “Kristallstrukturanalyse des ϵ,ζ -Proteinkomplexes, kodiert vom Plasmid pSM19035 aus *Streptococcus pyogenes*.” at the Institute for Chemistry and Biochemistry, Free University Berlin, supervised by Prof. Dr. Wolfram Saenger.
1998 Graduated “*summa cum laude*” in Crystallography and Mineralogy (Mag. rer. nat.), University of Vienna, Austria.
1998 Diploma thesis: “Strukturchemie von Salzen der Amidosulfonsäure mit einwertigen Kationen: Kristallzüchtung und ausgewählte kristallphysikalische Eigenschaften.” at the Institute for Mineralogy and Crystallography, University of Vienna, Austria, supervised by Prof. Dr. Ekkehard Tillmanns.
1997 - 1998 DAAD fellowship at the Institute of Crystallography, University of Cologne.
1993 - 1997 Studies at the University of Vienna, Austria.

Honors, Awards and Memberships

2011 Chica and Heinz Schaller Research Award.
2009 - Member of “The Hartmut Hoffmann-Berling International Graduate School of Molecular and Cellular Biology” (HBIGS) at the Ruprecht-Karls University, Heidelberg.
2009 - Member of CellNetworks, Ruprecht-Karls University of Heidelberg.
2008 - “*Zweitgutachterfunktion*” in Biochemistry / Biophysics at the Faculty for Biological Science, Ruprecht-Karls University, Heidelberg
2003 - 2004 EMBO Long Term Fellowship (ALT 399 – 2003).
1999 Young Scientist Award, University of Vienna.
1997 Fellowship from the German Academic Exchange Service (DAAD).
1997 Fellowship from the University of Vienna.

List of Publications

peer reviewed

- (26) Lunde, B.M., Magler, I., **Meinhart, A.** (2012) Crystal structures of the Cid1 poly (U) polymerase reveal the mechanism for UTP selectivity. *Nucleic Acids Res.* 40(19) 9815-9824.
- (25) Benz, J., Sendlmeier, C., Barends T.R.M., **Meinhart, A.** (2012) Structural Insights into the Effector – Immunity System Tse1/Tsi1 from *Pseudomonas aeruginosa*. *PLoS One* 7(7) e40453.
- (24) Holbein, S., Scola, S., Loll, B., Dichtl, B.S., Hübner, W., **Meinhart, A.**, Dichtl, B. (2011) The P-loop domain of yeast Clp1 mediates interactions between CF IA and CPF factors in pre-mRNA 3'-end formation. *PLoS One* 6(12) e29139.
- (23) Mutschler, H., **Meinhart, A.** (2011) ϵ/ζ systems: their role in resistance, virulence, and their potential for antibiotic development. *J. Mol. Med.*, 89(12) 1183-1194.
- (22) Lomb, L., Barends T.R.M, Kassemeyer, S., Andrew Aquila A., Epp, S.W., Erk, B., Foucar, L., Hartmann, R., Rudek, B., Rolles, D., Rudenko, A., Shoeman, R.L., Andreasson, J., Bajt, S., Barthelmess, M., Barty, A., Bogan, M.J., Bostedt, C., Bozek, J.D., Caleman, C., Coffee, R., Nicola Coppola, DePonte, D.P., Doak, R.B., Ekeberg, T., Fleckenstein, H., Fromme, P., Gebhardt, M., Graafsma, H., Gumprecht, L., Hampton, C.Y., Hartmann, A., Hauser, G., Hirseman, H., Holl, P., Holton, J.M., Hunter, M.S., Kabsch, W., Kimmel, N., Kirian, R.A., Liang, M., Maia, F.R.N.C., **Meinhart, A.**, Marchesini, S., Martin, A.V., Nass, K., Reich, C., Schulz, J., Seibert, M.M., Sierra, R., Soltau, H., Spence, J.C. H., Steinbrener, J., Stellato, F., Stern, S., Timneanu, N., Wang, X., Weidenspointner, G., Weierstall, U., White, T.A., Wunderer, C., Chapman, H.N., Ullrich, J., Strüder L., Schlichting, I. (2011) Radiation damage in protein serial femtosecond crystallography using an x-ray free-electron laser. *Physical Review B* 84(21), 1-6.
- (21) Mutschler, H., Gebhardt, M., Shoeman, R.L., **Meinhart, A.** (2011) A Novel Mechanism of Programmed Cell Death in Bacteria by Toxin – Antitoxin Systems Corrupts Peptidoglycan Synthesis. *PLoS Biology* 9(3) e1001033
- (20) Lunde, B.M., Hörner, M., **Meinhart, A.** (2011) Structural insights into *ois* element recognition of non-polyadenylated RNAs by the Nab3-RRM. *Nucleic Acids Res.* 39(1) 337-346.
- (19) Lunde, B.M., Reichow, S.L., Kim, M., Suh, H., Leeper, T.C., Yang, F., Mutschler, H., Buratowski, S., **Meinhart, A.**, Varani, G. (2010) Cooperative interaction of transcription termination factors with the RNA polymerase II C-terminal domain. *Nat. Struct. Mol. Biol.* 17(10)1195-1201.
- (18) Mariconti, L., Loll, B., Schlinkmann, K., Wengi, A., **Meinhart, A.**, Dichtl, B. (2010) Coupled RNA polymerase II transcription and 3' end formation with yeast whole cell extracts. *RNA* 16(11) 2205-2217.
- (17) Cryle, M.J., **Meinhart, A.**, Schlichting, I. (2010) Structural characterization of OxyD, a cytochrome P450 involved in beta-hydroxytyrosine formation in vancomycin biosynthesis. *J. Biol. Chem.* 285(32): 24562-24574.
- (16) Mutschler, H., Reinstein, J., **Meinhart, A.** (2010) Assembly dynamics and stability of the pneumococcal epsilon zeta antitoxin toxin (PezAT) system from *Streptococcus pneumoniae*. *J. Biol. Chem.* 285(28): 21797-21806.
- (15) Loll, B., Gebhardt, M., Wahle, E., **Meinhart, A.** (2009) Crystal structure of the EndoG/EndoGI complex: mechanism of EndoG inhibition. *Nucleic Acids Res.* 37(21): 7312-7320.

- (14) Temme, C., Weissbach, R., Lilie, H., Wilson, C., **Meinhart, A.**, Meyer, S., Golbik, R., Schierhorn, A., Wahle, E. (2009) The *Drosophila melanogaster* Gene cg4930 Encodes a High Affinity Inhibitor for Endonuclease G. *J. Biol. Chem.* 284(13): 8337-8348.
- (13) Vasiljeva, L., Kim, M., Mutschler, H., Buratowski, S., **Meinhart, A.** (2008) The Nrd1-Nab3-Sen1 termination complex interacts with the Ser5-phosphorylated RNA polymerase II C-terminal domain. *Nat. Struct. Mol. Biol.* 15(8): 795-804.
- (12) Becker, R., Loll, B., **Meinhart, A.** (2008) Snapshots of the RNA processing factor SCAF8 bound to different phosphorylated forms of the carboxyl-terminal domain of RNA polymerase II. *J. Biol. Chem.* 283(33):22659-22669.
- (11) Khoo, K.S., Loll, B., Chan, W.T., Shoeman, R.L., Ngo, L., Yeo, C.C., **Meinhart, A.** (2007) Molecular and structural characterization of the PezAT chromosomal toxin-antitoxin system of the human pathogen *Streptococcus pneumoniae*. *J. Biol. Chem.* 282(27): 19606-19618.
- (10) **Meinhart, A.**, Kamenski, T., Hoepfner, S., Baumli, S., Cramer, P. (2005) A structural perspective of CTD function. *Genes Dev.* 19(12): 1401-1415
- (9) Armache, K.J., Mitterwegger, S., **Meinhart, A.**, Cramer, P. (2005) Structures of complete RNA polymerase and its subcomplex Rpb4/7. *J. Biol. Chem.* 280 (8): 7131-7134
- (8) Kamenski, T., Heilmeyer, S., **Meinhart, A.**, Cramer, P. (2004) Structure and Mechanism of RNA Polymerase II CTD Phosphatases. *Mol. Cell* 15(3): 399-407
- (7) **Meinhart, A.**, Cramer, P. (2004) Recognition of RNA polymerase II carboxy-terminal domain by 3'-RNA processing factors. *Nature* 430: 223-226
- (6) **Meinhart, A.**, Blobel, J., Cramer, P. (2003) An Extended Winged Helix Domain in General Transcription Factor E/IIEx. *J. Biol. Chem.* 278(48): 48267-48274
- (5) **Meinhart, A.**, Silberzahn, T., Cramer, P. (2003) The mRNA Transcription/Processing Factor Ssu72 Is a Potential Tyrosine Phosphatase. *J. Biol. Chem.* 278(18): 15917-15921
- (4) **Meinhart, A.**, Alonso, J.C., Sträter, N., Saenger, W. (2003) Crystal structure of the plasmid maintenance system ϵ/ζ : Functional mechanism of toxin ζ and inactivation by $\epsilon_2\zeta_2$ complex formation. *Proc. Natl. Acad. Sci. U.S.A.* 100(4): 1661-1666
- (3) Camacho, A.G., Misselwitz, R., Behlke, J., Ayora, S., Welfle, K., **Meinhart, A.**, Lara B., Saenger, W., Welfle, H., Alonso, J.C. (2002) *In vitro* and *in vivo* Stability of the $\epsilon_2\zeta_2$ Complex of the Broad Host-Range *Streptococcus pyogenes* pSM19035 Addiction System. *Biol. Chem.* 383: 1701-1713
- (2) **Meinhart, A.**, Alings, C., Sträter, N., Chamacho, A.G. Alonso, J.C., Saenger, W. (2001) Crystallization and preliminary X-ray diffraction studies of the epsilon zeta addiction system encoded by *Streptococcus pyogenes* plasmid pSM19035 *Acta Cryst. D*(57): 745-747
- (1) **Meinhart, A.**, Haussühl, E., Haussühl, S., Tillmanns, E., (2001) Crystal structures of sulfamates $\text{MeLi}(\text{NH}_2\text{SO}_3)_2$ (Me: K, Rb and Cs) and physical properties of $\text{KLi}(\text{NH}_2\text{SO}_3)_2$ (refractive indices, thermal expansion, elastic properties). *Z. Kristallogr.* 216: 513-521

Non peer reviewed

contributed book chapter:

Mutschler, H., **Meinhart, A.** Type II TA Loci: The Epsilon/Zeta family *in* Prokaryotic Toxin-Antitoxins, ed. Kenn Gerdes (Heidelberg: Springer, 2012)

invited articles in journals:

Rocker, A., Mutschler, H., **Meinhart, A.** (2013) Der tödliche Mechanismus der Zeta-Toxine Biospektrum(2): 131-133

Mutschler, H., **Meinhart, A.** (2011) Hilfreiche Killer: Bakterien vergiften sich von innen heraus. labor&more (4): 12-16

Patent application:

Mutschler, H., **Meinhart, A.** (2010). Rekombinante Erzeugung von aktiven Zeta-Toxinen (Uridindiphosphat *N*-acetyl-*D*-Glucosamin-3' Kinasen) und enzymatische Produktion des Produkts Uridindiphosphat *N*-acetyl-*D*-Glucosamin-3-Phosphat und dessen Derivate.

Invited Talks since 2004:

- 2013 BacNet13 Meeting, Pultusk, Poland
- 2012 Helmholtz Centre for Infection Research and Technical University Braunschweig, Braunschweig.
Robert Koch Institute, Wernigerode.
Chica and Heinz Schaller Foundation, Heidelberg.
- 2011 Paul Ehrlich Foundation, Frankfurt.
National Center for Biomolecular Research, Masaryk University, Brno, Czech Republic.
Max Planck Institute of Molecular Physiology, Dortmund.
Institute for Chemistry and Biochemistry, Free University of Berlin.
- 2010 Institute for Biophysics and physical Biochemistry, University of Regensburg.
- 2008 DGK Meeting Erlangen.
MRC Medical Research Council, Laboratory of Molecular Biology, Cambridge, United Kingdom.
- 2006 Institute for Biochemistry and Biotechnology, Martin-Luther University Halle-Wittenberg.
- 2005 DGK Meeting, Cologne.
Murnau Conference.
- 2004 Max Planck Institute for Medical Research, Heidelberg.
Institute for Molecular Biotechnology, Vienna, Austria.

Referee activities since 2004:

Acta Cryst., DFG, EMBO J., EMBO R., FEBS J., FEMS Microbiology L., HFSP, J. Antimicrob. Chemother., Nat. Struct. Mol. Biol., Nucleic Acids Res., Plasmid, PLoS ONE, RNA, Structure, Science;

Additional qualifications:

- 2008 "Fachkunde zur Gentechniksicherheit"
- 2006 EMBO Fellows Laboratory Management Course
- 2004 "Fachkunde zum Strahlenschutz"

Supervision of Ph.D. theses

- 2010 - Andrea Rucker, "Functional characterization of enterobacterial zeta toxin modules." HBIGS.
- 2010 - Julian Kellner, "Structural and functional characterization of DEAD-box helicases involved in RNA processing.", HBIGS.
- 2010 - Juliane Benz, "Structural and functional characterization of eukaryotic RNA polynucleotide kinases.", HBIGS.
- 2009 - Aytac Dikfidan, "Structural and functional characterization of the eukaryotic RNA polynucleotide kinase Clp1.", HBIGS.
- 2007 - 2011 Hannes Mutschler, "Functional mechanism of the pneumococcal PezAT toxin-antitoxin system.", Ruprecht-Karls University, Heidelberg.
Honors and Awards to Hannes Mutschler for his Ph.D. thesis:
Otto Hahn Medal, Max Planck Society.
Karl Freudenberg Award, Heidelberg Academy of Sciences and Humanities.
Bayer HealthCare Ph.D. award, GBM.
- 2005 - 2009 Roland Becker, "Revealing the interactions of RNA polymerase II binding proteins – Characterization of CTD-interaction domains.", Ruprecht-Karls University, Heidelberg.

Supervision of Master and Bachelor theses

- 2010 Andrea Rocker, “Structural characterization of archeal RtcB homologues.”, Ruprecht-Karls University, Heidelberg.
- 2008 Maike Jürgens, “Expression, Purification and Crystallization of the HipA/HipB protein complex from *Klebsiella pneumoniae*.”, Ruprecht-Karls University, Heidelberg.

Supervision of Practical Students

- 2004 - Several undergraduate students have been supervised during practical courses in my research group since 2004.

Postdoctoral fellows

- 2012 - Dr. Iris Magler
- 2010 - 2012 Bradley M. Lunde, Ph.D., now at XL-protein GmbH, Freising.
- 2006 - 2010 Dr. Bernhard Loll, now project leader at the Institute Chemistry and Biochemistry, Free University Berlin.